TM 11-5815-264-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

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OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

TELETYPEWRITERS TT243/FG AND TT-247/FG

HEADQUARTERS, DEPARTMENT OF THE ARMY

APRIL 1960

WARNING

DANGEROUS VOLTAGES EXIST IN THESE TELETYPEWRITERS

Be careful when performing maintenance within the cabinet. Serious injury or death may result from contact with the 115-volt circuits. Turn off the power before replacing any parts inside the cabinet.

DON'T TAKE CHANCES!

TM 11–5815–264–12
C 3

CHANGE
NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *21 December 1973*

Operator's and Organizational Maintenance Manual TELETYPEWRITERS TT–243/FG AND TT–247/FG

TM 11–5815–264–12, 5 April 1960, is changed as follows:

Page 3. Paragraph 1.1 is superseded as follows:

1.1. Indexes of Publications

a. DA Pam 310–4. Refer to the latest issue of DA Pam 310–4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310–7. Refer to DA Pam 310–7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

Paragraph 2 is superseded as follows:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records, and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38–750.

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Report of Packaging and Handling Deficiencies) as prescribed in AR 700–58 (Army)/NAVSUP PUB 378 (Navy)/AFR 71–4 (Air Force)/ and MCO P4030.29 (Marine Corps).

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55–38 (Army)/NAVSUP PUB 459 (Navy)/AFM 75–34 (Air Force)/and MCO P4610.19 (Marine Corps).

Paragraph 2.1 is added as follows:

2.1. Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL–MA–C, Fort Monmouth, NJ 07703.

Page 5. In paragraph 5, subparagraph *a*, change "Components" to "Components and Dimensions."

Subparagraph *c* is added as follows:

c. Items Comprising an Operable Equipment.

FSN	Quantity		Nomenclature, part No., and mfr code
	TT–243/FG	TT–247/FG	
5815–705–4997	1	1	Gear, Helical: Teletype part No. 159278 (60 WPM Installed in equipment).
5815–705–4998	1	1	Gear, Helical: Teletype part No. 159279 (60 WPM Installed in equipment).
5815–705–4999	1	1	Gear, Helical: Teletype part No. 159281 (75 WPM Packaged separately).
5815–706–6664	1	1	Gear, Helical: Teletype part No. 159282 (75 WPM Packaged separately).

FSN	Quantity		Nomenclature, part No., and mfr code
	TT-243/FG	TT-247/FG	
5815-705-5001	1	1	Gear, Helical: Teletype part No. 159284 (100 WPM Packaged separately).
5815-705-5003	1	1	Gear, Helical: Teletype part No. 159285 (100 WPM Packaged separately).
5815-705-5004	1	1	Isolator: Teletype part No. 159267 (Installed)
7530-281-2691	1	1	Paper, Teletypewriter, Roll: type No. 1, Class 1, No. B UU-P-547, 81348.
	2	2	Post: Teletype part No. 161301 (Installed)
7510-162-5643	1	1	Ribbon, Teletypewriter: type A, Class A (Installed) DDD-R-311, 81348.
5815-370-0343	1	1	Spindle, Paper: Teletype part No. 150907 (Installed)
5815-356-3062	1	1	Spool, Ribbon: Teletype part No. 71681 (Installed)

Paragraph 5 is added as follows:

5.1. Expendable Consumable Items

A list of expendable consumable items required for operation appears in table 1–1.

Table 1–1. Expendable Consumable Supplies and Materials

The supplies and material listed in this table are required for operation of this equipment and are authorized to be requisitioned by SB 700–50. The FSN for the applicable unit of issue required can be found in appropriate supply catalogs. The FSCM is used as an element in item identification to designate manufacturer or distributor or Government agency, etc., and is identified in SB 708–42.

Item	*Description*	*Ref No. and FSCM*	*FSC*
1	Paper, Teletypewriter, Roll type.	UU–P–517 81348	7530
2	Ribbon, Teletypewriter type A, class 1.	DDD–R–311 81348	7510

Page 25. Appendix III is deleted, except for figures 14 and 15.

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

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TECOM (2)
USACC (4)
MDW (1)
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Corps (2)
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Svc Colleges (1)
USASESS (5)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAINTS (3)
WRAMC (1)
USACDCEC (10)
ATS (1)
Instl (2) except
Fort Gordon (10)
Fort Huachuca (10)
WSMR (1)
Fort Carson (5)
Ft Richardson (ECOM Ofc) (2)
Army Dep (2) except:
LBAD (14)
SAAD (30)
TOAD (14)
ATAD (10)
USA Dep (2)
Sig Sec USA Dep (2)
Sig Dep (2)
Sig FLDMS (1)
USAERDAA (1)
USAERDAW (1)
MAAG (1)
USARMIS (1)
Units org under fol TOE (1 each):
11-16
11-97
11-98
11-158
11-302
11-500 (AA-AC)
29-134
29-136

NG: None

USAR: None

For explanation of abbreviations used, see AR 310-50.

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TECHNICAL MANUAL

Operator and Organizational Maintenance Manual TELETYPEWRITERS TT–243/FG AND TT–247/FG

TM 11–5815–264–12
CHANGE NO. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *23 September 1963*

TM 11–5815–264–12, 5 April 1960, is changed as follows:

Note. The parenthetical reference to a previous change (example: "page 1 of C 1") indicates that pertinent material was published in that change.

Page 3. Make the following changes:

Add paragraph 1.1 after paragraph 1.

1.1. Index of Publications

Refer to the latest issue of DA Pam 310–4 to determine whether there are new editions, changes, or additional publications pertaining to your equipment. DA Pam 310–4 is an index of current technical manuals, technical bulletins, lubrication orders, and modification work orders which are available through publications supply channels. The index lists the individual parts (–10, –20, –35P, etc.) and the latest changes to and revisions of each publication.

Delete paragraph 2 (page 1 of C 1) and substitute:

2. Forms and Records

a. Reports of Maintenance and Unsatisfactory Equipment. Use equipment forms and records in accordance with instructions in TM 38–750.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58 (Army), NAVSANDA Publication 378 (Navy), and AFR 71–4 (Air Force).

c. Reporting of Equipment Manual Improvements. The direct reporting by the individual user of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8 or 9) will be used for reporting these improvements. This form will be completed in triplicate using pencil, pen, or typewriter. The original and one copy will be forwarded direct to: Commanding Officer, U.S. Army Electronics Materiel Support Agency, ATTN: SELMS–MP, Fort Monmouth, N.J. 07703. One information copy will be furnished to the individual's immediate supervisor (e.g., officer, noncommissioned officer, supervisor, etc.).

Page 19. Make the following changes:

Delete paragraph 16 and substitute:

16. Scope of Maintenance

The maintenance duties assigned to the operator of Teletypewriters TT–243/FG and TT–247/FG are listed below, together with a reference to the paragraphs covering the specific maintenance functions. The duties assigned do not require tools or test equipment.

a. Daily preventive maintenance checks and services (par. 19).

b. Weekly preventive maintenance checks and services (par. 19.1).

c. Cleaning (par. 19.2).

d. Troubleshooting (par. 21).

e. Repairs and adjustments.
(1) Removal of type box (par. 20*a*).

(2) Replacement of type box (par. 20*c*).
(3) Rangefinder adjustment (par. 22).
(4) Replacement of fuses (par. 23*a*).
(5) Replacement of lamps (par. 23*b*).
(6) Replacement of line relay (par 23*c*).
(7) Replacement of paper (par. 11).
(8) Replacement of ribbon (par. 12).

Delete paragraph 18 and substitute:

18. Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable.

a. Systematic Care. The procedures given in paragraphs 19 through 23 cover routine systematic care and cleaning essential to proper upkeep of this equipment when it is used separately. When this equipment is used as part of a *set,* or *system,* follow the procedures established in the *set* or *system* manual.

b. Preventive Maintenance Checks and Services. The preventive maintenance checks and services charts (pars. 19 and 19.1) outline functions to be performed at specific intervals; however, if the equipment is used as part of a *set* or *system,* follow the procedures established in the *set* or *system* manual For equipments operated separately, these checks and services are to maintain Army electronic equipment in a combat-serviceable condition; that is, in good general (physical) condition and in good operating condition. To assist operators in maintaining combat serviceability, the chart indicates what to check, how to check, and what the normal conditions are; the References column lists the illustrations, paragraphs, or manuals that contain supplementary information. If the defect cannot be remedied by the operator, higher echelon maintenance or repair is required. Records and reports of these checks and services must be made in accordance with the requirements set forth in TM 38–750.

Add paragraph 18.1 after paragraph 18.

18.1. Preventive Maintenance Checks and Services Periods

Preventive maintenance checks and services of the TT–243/FG and TT–247/FG are required on a daily and a weekly basis.

a. Paragraph 19 specifies checks and services that must be accomplished daily and under the special conditions listed below when the equipment is used in transportable and mobile installations.

(1) When the equipment is initially installed.

(2) When the equipment is reinstalled after removal for any reason.

b. Paragraph 19.1 specifies additional checks and services that must be performed once each week.

Delete paragraph 19 and substitute:

19. Daily Preventive Maintenance Checks and Services Chart

Sequence No.	Item	Procedure	References
1	TT–243/FG or TT–247/FG.	Ascertain that the equipment has a full complement of required components and running spares.	App. II, sec. II.
2	Exterior surfaces	Remove dirt, grease, or moisture from all exposed surfaces.	Par. 19.2
3	Painted surfaces	Observe any trace of chips, cracks, corrosion, or mildew.	None.
4	Catches, latches, and hinges.	During cleaning operations, inspect for broken, missing, or loose catches, latches, or hinges.	None.
5	Glass	Check for broken glass in copy window or indicator lamp.	None.
6	External cords	Check for cuts, cracked or gouged jackets, fraying, bad bruises, or kinks.	None.
7	Paper	Inspect installed paper roll and reserve supply to assure the presence of an adequate supply.	Par. 11.
8	Ac power cord	Connect to 115-volt, 60-cycle per second, single phase power source.	None.
9	LINE-TEST switch	Set switch to TEST to isolate the equipment from the signal line.	Fig. 7.
10	Copy light switch	Set switch to NORMAL ON to place copy lights under control of the power switch.	Fig. 4.
11	Power switch lever	Move to upper position to start motor and light copy lamps. Press BREAK key if motor fails to start.	Fig. 4.
12	SEND key	Press SEND key and type test copy. All character keys should operate freely.	Fig. 8.
13	Single-double line feed lever.	Press the LINE FEED key with the single-double line feed lever at the forward position for a single line feed operation. Press the LINE FEED key with the lever in the rearward position for a double line feed operation.	Fig. 5.
14	LOC LF key	Press and hold key downward. Check for continuous line feed operations until the key is released.	Fig. 8.
15	LOC CR key	Press LOC CR key to return the type box of the local teletypewriter to the left-hand margin.	Fig. 8.
16	Ribbon oscillation	Type test copy and observe the action of the ribbon. Be sure the ribbon moves upward and downward each time a character is printed. Replace ribbon if worn or frayed.	Fig. 10 and par. 12.
17	Ribbon feed	Type test copy and observe the action of the ribbon. Be sure the ribbon feeds horizontally as characters are printed.	Fig. 10.
18	Ribbon reverse	Type test copy. Be sure the direction of ribbon feeding is automatically reversed when almost the full length of ribbon is wound on one spool. Check for both directions.	Fig. 10.
19	CAR RET key	Type test copy until the type box carriage is near the right-hand margin. Press the CAR RET key. The type box carriage should return to the left-hand margin in a smooth and positive manner.	Fig. 8.
20	Spacebar	Press the spacebar fully and hold down. The type box carriage should move steadily toward the right margin. When the carriage reaches the right margin, it should return automatically with a simultaneous automatic line feed operation.	Fig. 8.
21	FIGS key	Press the FIGS key to move the type box carriage to the figures-shift position (indicated by the FIGS pointer on the type box).	Figs. 5 and 8.

19. Daily Preventive Maintenance Checks and Services Chart —(Continued)

Sequence No.	Item	Procedure	References
22	LTRS key	Press the LTRS key to move the type box carriage to the letters-shift position.	Figs. 5 and 8.
23	End-of-line indicator	With the type box carriage at the extreme left-hand margin, type 60 characters. Resume typing slowly, and carefully observe the end-of-line indicator. It should light when the 66th character is typed. Press the CAR RET key to return the type box carriage to the left-hand margin and to extinguish the indicator lamp.	Fig. 1.
24	BELL (upper case S) key	Press the FIGS key and the BELL key in sequence to ring the signal bell.	Fig. 8.
25	REC key	Press and release the REC key. The key should remain in the lower position and the keyboard lock should be operative. The REC key should move to the upper (keyboard unlock) position *only* when the SEND key is pressed.	Fig. 8.
26	Blank key	Press the blank key three successive times. The REC key should move automatically to the lower (keyboard lock) position.	Fig. 8.
27	STOP (upper case H) key	Press the FIGS key and the STOP key in sequence. The motor should stop. Press the break key for approximately 3 seconds to restart the motor.	Fig. 8.
28	REPT key	Press the REPT key and any character key simultaneously. The selected character will be transmitted continuously until the REPT key is released.	Fig. 8.
29	Printed copy	Type several lines of the following test message and check the printed copy for accuracy and alignment: THE QUICK BROWN FOX JUMPED OVER THE LAZY DOG'S BACK 1234567890.	Par. 23c.

Add paragraphs 19.1 and 19.2 after paragraph 19.

19.1. Weekly Preventive Maintenance Check and Service

Inspect printed copy for clarity and readability of all the printed characters. Remove the type box (par. 20) and clean the type pallets if copy is blurred or smudged.

19.2. Cleaning

Inspect the exterior of the cabinet. The exterior surfaces should be clean and free of dust, dirt, grease, and fungus.

a. Remove dust and loose dirt with a clean soft cloth.

b. Remove grease, fungus, and ground-in dirt from the cabinet with a cloth dampened (not wet) with cleaning compound.

c. Use a brush to remove dust or dirt from the keyboard controls (fig. 8), the copyholder, the external pushbuttons, and the switches.

d. Clean the copy window and the keytops with a soft clean cloth. If dirt is difficult to remove. dampen the cloth with water. Mild soap may be used, if required, for more effective cleaning.

Page 20. Delete figure 12.

Page 21. Delete figure 13.

Page 22, paragraph 21. Change the heading of paragraph 21 to: Operator's Troubleshooting Checklist.

Page 24, chapter 4. Add Appendix I after chapter 4.

APPENDIX I

REFERENCES

The following references are applicable to Teletypewriters TT–243/FG and TT–247/FG.

DA Pam 310–4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
TM 38–750	The Army Equipment Record System and Procedures.

Page 25, appendix. Identify the appendix as APPENDIX II.

Appendix II (page 2 of C 1). Change to APPENDIX III.

BY ORDER OF THE SECRETARY OF THE ARMY:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

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USATC Armor (2)
USASTC (5)
Instl (2) except
Ft Monmouth (65)
Svc Colleges (2)
Br Svc Sch (2) except
GENDEP (OS) (2)
Sig Dep (OS) (12)
Sig Sec, GENDEP (5)
Army Dep (2) except
Ft Worth (8)
Lexington (12)
Sacramento (28)
Tobyhanna (12)
USA Elct RD Actv, White Sands (13)
USA Elct RD Actv, Ft Huachuca (2)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
USAOSA (1)
AMS (1)
WRAMC (1)
AFIP (1)
Army Pic Cen (2)
USA Mbl Spt Cen (1)
USA Elct Mat Agcy (12)
Chicago Proc Dist (1)
USARCARIB Sig Agcy (1)
Sig Fld Maint Shop (3)
Units org under fol TOE
(2 cy ea UNOINDC):
11–7
11–16
11–57
11–97
11–98
11–155
11–157
11–500 (Tms AA–AE) (4)
11–557
11–587
11–592
11–597

NG: State AG (3).

USAR: None.

For explanation of abbreviations used, see AR 320–50.

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TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

TELETYPEWRITERS TT-243/FG AND TT-247/FG

TM 11-5815-264-12
CHANGES NO. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY,
WASHINGTON 25, D. C., *9 September 1960*

TM 11-5815-264-12, 5 April 1960, is changed as follows:

Cover. Change "TT243/FG" to: **TT-243/FG.**

Page 3, paragraph 2.

Subparagraph *a,* line 4. Change "Equipment Support Agency" to: **Material Support Agency, ATTN: SIGMS-MLM.**

Subparagraph *d,* lines 5 6, and 7. Change to: **Material Support Agency, ATTN: SIGMS-MLM,** Fort Monmouth, N. J., with comments on appendixes I and II.

Subparagraph *e,* line 3. Change "Publications Agency" to: **Material Support Agency, ATTN: Pub Engrg Dept.**

Page 5, paragraph 5*a.* Add the following after the last item:

Item	Equipment marking	Quantity		Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
		TT-243/FG	TT-247/FG				
Gear, nylon, pinion (fig. 15):							
159278 (60 WPM)		1	1				
159281 (75 WPM)		1	1				
159284 (100 WPM)		1	1				
Gear, nylon, driven (fig. 15):							
159279 (60 WPM)		1	1				
159282 (75 WPM)		1	1				
159285 (100 WPM)		1	1				
Isolator, 159287 (fig. 15)		1	1				
Post, 161301 (fig. 15)		1	1				
Spindle, 150907 (fig. 14)		2	2				

Page 6, figure 3. Change the callouts as follows:

Below RELAY RE-163/G add: K2.
Below RIBBON add: 7835.
Below PAPER add: 78903.
Below FUSE add: F1.

Add the following callout to identify the spool directly above the fuse: SPOOL 71681.

Page 25, heading. Change APPENDIX to: **APPENDIX I.**

APPENDIX II

BASIC ISSUE ITEMS LIST

(Added)

Section 1. INTRODUCTION

1. Scope

a. This appendix lists items supplied for initial operation and for running spares. The list includes accessories, parts, and material issued as part of the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. The contents of the columns in the functional parts list (sec. II) are described below.

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number. In the absence of a Federal stock number, an interim number (for example: LOW b10-11) in the "Description" column indicates that an applicable Federal stock number is being processed for assignment. In the interim, the L number may be used to identify items.

(3) *Designation by model.* A dagger (†) in this column indicates the model in which the part is used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description on the requisition.

(5) *Unit of issue.* The unit of issue shown in this column is the supply medium by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* In this column, ex-expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under ITEMS COMPRISING AN OPERABLE EQUIPMENT this column lists the quantity of items supplied for the initial operation of the equipment. Under RUNNING SPARES AND ACCESSORY ITEMS the quantities listed in this column are those issued initially with the equipment as spare parts. The listed quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) Illustrations. The "Figures No." and "Item No." columns list illustrations which show the parts and the reference designations that are assigned to the parts.

2. References

Refer to the maintenance allocation chart (appendix I) for information concerning the assignment of maintenance functions for the equipment.

Section II. FUNCTIONAL PARTS LIST

(1) SOURCE MAINTENANCE AND RECOVERABILITY CODE	(2) FEDERAL STOCK NUMBER	(3) DESIGNATION BY MODEL	(4) DESCRIPTION	(5) UNIT OF ISSUE	(6) EXPENDABILITY	(7) QUANTITY AUTHORIZED	(8) ILLUSTRATIONS	
							FIGURE NO.	ITEM NO.
		1 2	ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			TELETYPEWRITER TT-243/FG AND TT-247/FG					
			NOTE: Model Column 1 refers to TT-243/FG, Model Column 2 refers to TT-247/FG.					
	5815-752-0922		TELETYPEWRITER TT-243/FG	ea	NX		1	
	5815-752-0923		TELETYPEWRITER TT-247/FG	ea	NX		4	
	Ord thru AGC	† †	TECHNICAL MANUAL: TM 11-5815-264-12	ea	X	2		
	5945-188-5631	† †	RELAY, ARMATURE, RE-163/G	ea	NX	1	3	K2
	7510-162-5643	† †	RIBBON, TELETYPEWRITER: Fed Spec No. DDD-R-311; type A, Class N (INSTALLED)	ea	X	1	3	7835
	5815-356-3062	† †	SPOOL, RIBBON: Teletype part No. 71681 (INSTALLED)	ea	X	1	3	71681
	7530-281-2691	† †	PAPER, TELETYPEWRITER, ROLL: Fed Spec No. UU-P-547, type No. 1, Class 1, No. B	ea	X	1	3	78903
	5815-370-0343	† †	SPINDLE, PAPER: Teletype part No. 150907 (INSTALLED)	ea	X	1	14	150907
	5815-705-4997	† †	GEAR, HELICAL: Teletype part No. 159278 (60 WPM - INSTALLED IN EQUIPMENT)	ea	X	1	15	159278
	5815-705-4998	† †	GEAR, HELICAL: Teletype part No. 159279 (60 WPM - INSTALLED IN EQUIPMENT)	ea	X	1	15	159279
	5815-705-4999	† †	GEAR, HELICAL: Teletype part No. 159281 (75 WPM - PACKAGED SEPARATELY)	ea	X	1	15	159281
	5815-706-6664	† †	GEAR, HELICAL: Teletype part No. 159282 (75 WPM - PACKAGED SEPARATELY)	ea	X	1	15	159282
	5815-705-5001	† †	GEAR, HELICAL: Teletype part No. 159284 (100 WPM - PACKAGED SEPARATELY)	ea	X	1	15	159284
	5815-705-5003	† †	GEAR, HELICAL: Teletype part No. 159285 (100 WPM - PACKAGED SEPARATELY)	ea	X	1	15	159285
	5815-705-5004	† †	ISOLATOR: Teletype part No. 159287 (INSTALLED)	ea	X	1	15	159287
		† †	POST: Teletype part No. 161301 (INSTALLED) †† LOWb10-11	ea	X	2	15	161301
			RUNNING SPARES AND ACCESSORY ITEMS					
			TELETYPEWRITER TT-243/FG AND TT-247/FG					
	7510-162-5643	† †	RIBBON, TELETYPEWRITER: Fed Spec No. DDD-R-311; type A, Class No. 1	ea	X	1	3	7835
	7530-281-2694	† †	PAPER, TELETYPEWRITER, ROLL: Fed Spec No. UU-P-547, type No. 1	ea	X	1	3	78903
	5920-532-4631	† †	FUSE, CARTRIDGE: Littelfuse No. 31004	ea	X	5	3	F1
	6240-797-4370	† †	LAMP, INCANDESCENT: Fed Spec No. M-L111, trade No. 82	ea	X	1	3	DS-1 DS-2
		† †	LAMP, INCANDESCENT: Teletype part No. 153400 †† LOWb12-15	ea	X	1	3	DS-3

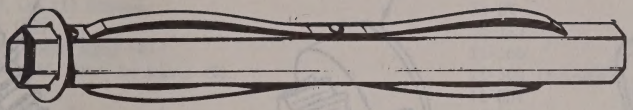

Figure 14. (Added) Spindle, 150907.

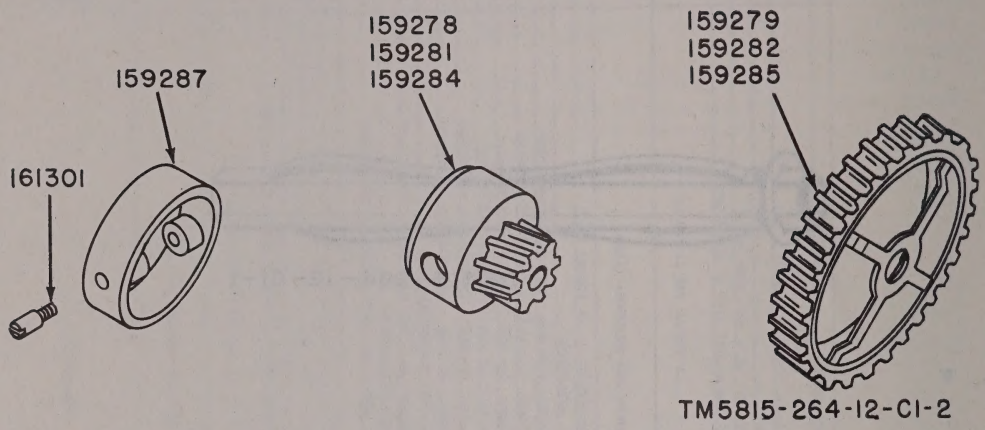

Figure 15. (Added) Gears, isolator, and post.

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General, United States Army,
Chief of Staff.

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NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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TECHNICAL MANUAL
No. 11-5815-264-12

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *5 April 1960*

TELETYPEWRITERS TT-243/FG AND TT-247/FG

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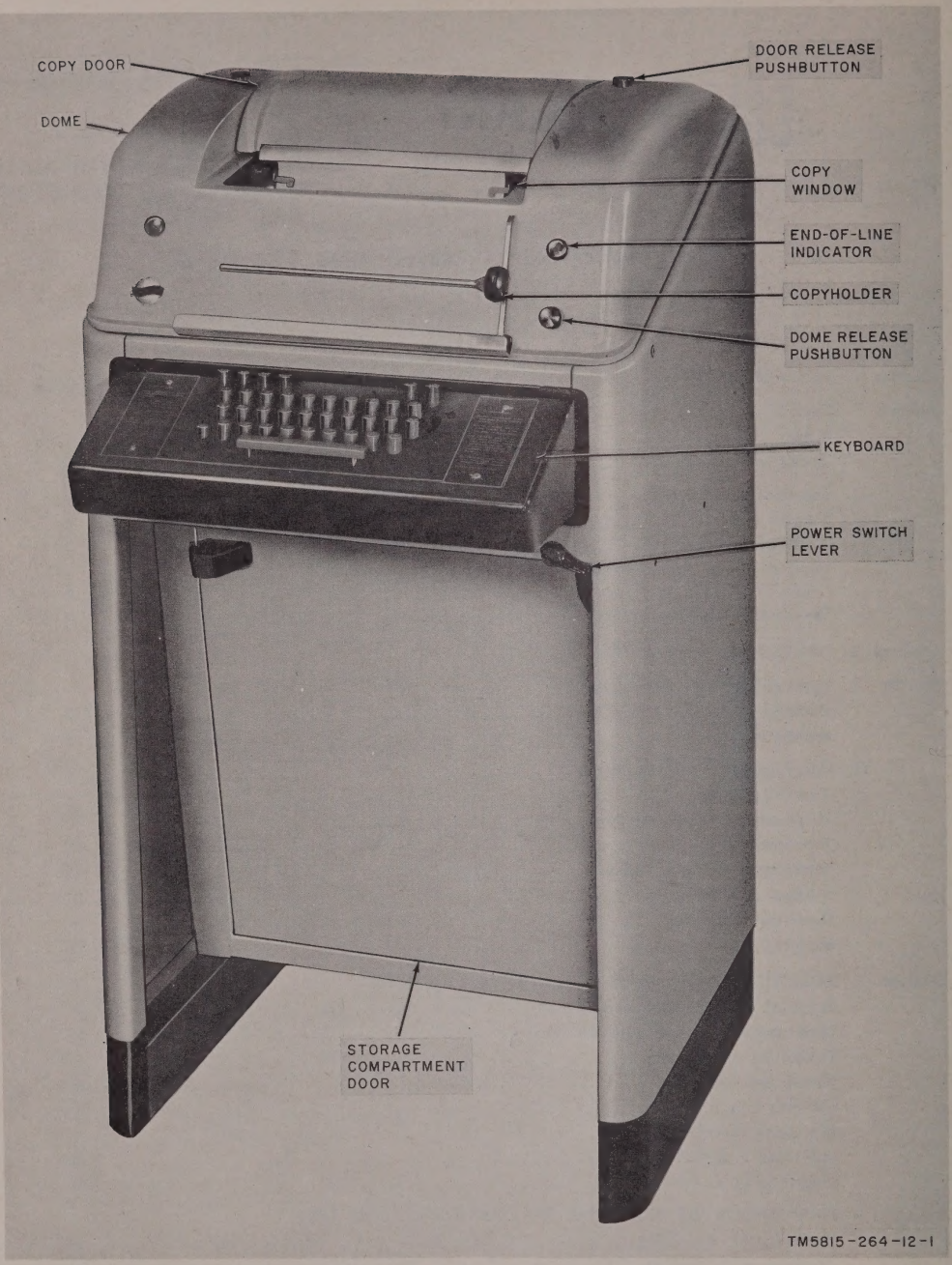


Figure 1. Teletypewriter TT-243/FG, less running spares.

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual describes Teletypewriters TT–243/FG and TT–247/FG and covers their operation and organizational maintenance.

b. Both teletypewriters are identical in operation and in the number and types of operating components. The only difference between them is that the TT–243/FG (fig. 1) is a floor model, and the TT–247/FG (fig. 4) is a table model. All information in this manual is applicable to both teletypewriters unless stated otherwise.

2. Forms and Records

a. Unsatisfactory Equipment Report. Fill out and forward DA Form 468 (Unsatisfactory Equipment Report), to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700–38.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700–58.

c. Preventive Maintenance Forms. Prepare DA Form 11–252 (Maintenance Checklist for Signal Equipment (Teletypewriter), in accordance with instructions on the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8, and 9), direct to the Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., with comments on the maintenance allocation chart, in the appendix.

e. Comments on Manual. Forward all other comments on this publication direct to the Commanding Officer, U. S. Army Signal Publications Agency, Fort Monmouth, N. J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Purpose. Teletypewriters TT–243/FG and TT–247/FG permit the transmission of teletypewriter messages in the form of direct-current (dc) neutral teletypewriter signals and the reception and conversion of similar signals into messages that are printed on a 3- to 8½-inch wide paper roll. Messages can be received in the form of either 20- or 60-milliampere (ma) signals.

b. Use. The teletypewriters can be used for half-duplex operation (par. 9) in dc, carrier, or radio teletypewriter systems (fig. 2), at operating speeds of 60, 75, or 100 words per minute (wpm). Neither teletypewriter includes a dc power supply for the external signal circuit.

4. Technical Characteristics

Type of installation ..	Fixed; transmit and receive (half-duplex operation) in dc, carrier or radio system.
Type of symbols	Standard communications.
Type of characters ...	English.
Input power requirements:	
Type of power	115-volt, 60-cps, single-phase, ac.
Power consumption .	Approx. 300 watts.
Signaling code	Five-unit, start-stop, stop impulse length equals start impulse length multiplied by 1.42.
Type of signals (transmit and receive) ...	Neutral (20 or 60 ma).
Speed:	
Operations per minute	368, 460, or 600.
Words per minute ..	60, 75, or 100.

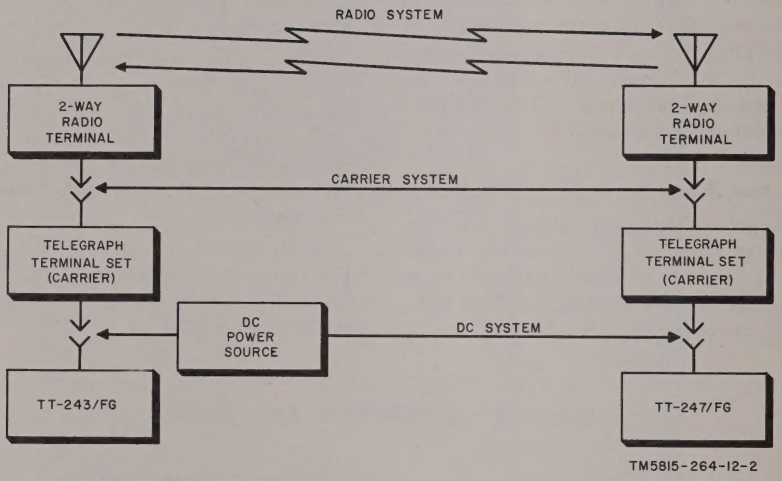


Figure 2. Typical system applications, block diagram.

Motor:
- Type ..... Synchronous.
- Speed ..... 3,600 rpm.
- Horsepower rating .. 1/20 hp.

Signal distortion tolerances:
- Transmitted signals . ±5% maximum.
- Received signals:
  - Bias tolerance .. 40%, marking or spacing.
  - End distortion tolerance ..... 35%, marking or spacing.

Type of paper feed ... Friction.

Paper capacity ..... 5-inch diameter roll, 8½ inches wide. Can be adjusted to accommodate paper of lesser widths (min. 3 in.).

Characters per line ... Adjustable from 1 to 85, set for 72.

Total weight (installed):
- TT–243/FG ..... Approximately 130 lb.
- TT–247/FG ..... Approximately 120 lb.

5. Components of Teletypewriters TT–243/FG and TT–247/FG

The components of both teletypewriters are listed in *a* below. The running spares provided with each teletypewriter are listed in *b* below.

a. Components.

Item	Equipment marking	Quantity		Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb.)
		TT–243/FG	TT–247/FG				
Typing unit (Fig. 5).	LP59WY/AFK	1	1	9¾	15½	10½	19
Motor units (Fig. 6).	LMU3	1	1	5¾	4	8½	10
Keyboard base (Fig. 6).	LK18BRE	1	1	4¾	17½	15½	11
Electrical service unit (Fig. 7).	LESU42	1	1	8½	5	15½	9
Relay RE–163/G (Fig. 3).	RY30(WE255A)	1	1	5¾	2⅝	2⅝	1½
Cabinet (Fig. 4).	LAC203BR149	–	1	16	18¼	20½	70
Cabinet (Fig. 1).	LAC204RB148	1	–	40½	18¼	20½	81
Running spares (*b* below).		1 set	1 set				

b. Running Spares (fig. 3).

Quantity	Item
5	Fuse, 4-amp, 115-volt.
1	Lamp, 6-8v, 8-watt.
1	Lamp, 60-v, 6-watt.
1	Relay RE–163/G (WECO 255A).
1	Ribbon.
4	Paper, roll, 8½ in. wide.

6. Description of Teletypewriters TT–243/FG and TT–247/FG

The TT–243/FG (fig. 1) and the TT–247/FG (fig. 4) are identical except for their cabinets (*a* below).

a. Cabinet. The TT–243/FG includes a floor-mounted cabinet that contains a lower storage compartment. The cabinet of the TT–247/FG is designed for table mounting and does not include a storage compartment. Both cabinets include identical upper compartments which house the operating components (fig. 4).

b. Typing Unit (fig. 5). The typing unit consists of the electrical and mechanical assemblies that print teletypewriter messages in page form. All parts of the typing unit are attached to a common frame assembly. The main drive shaft (not shown) is mounted across the lower rear portion of the typing unit.

c. Keyboard Base. The keyboard base consists of a keyboard-transmitter and an aluminum sheet-metal base assembly. The keyboard-transmitter includes a keyboard (figs. 4 and 8) and a signal generator (fig. 6). The base assembly provides mounting facilities for the motor unit and the typing unit.

d. Motor unit (fig. 6). The motor unit includes a synchronous motor, shock mounted on a motor-mounting frame. An overload reset button (not shown) is mounted on the right rear corner of the motor mounting frame, adjacent to the fan. A box on the underside of the frame houses electrical components of the motor circuit.

e. Electrical service unit (fig. 7). The electrical service unit includes a sheet-metal chassis on which are mounted components of the power and signal circuits. A power switch (not shown) is located on the right side of the unit.

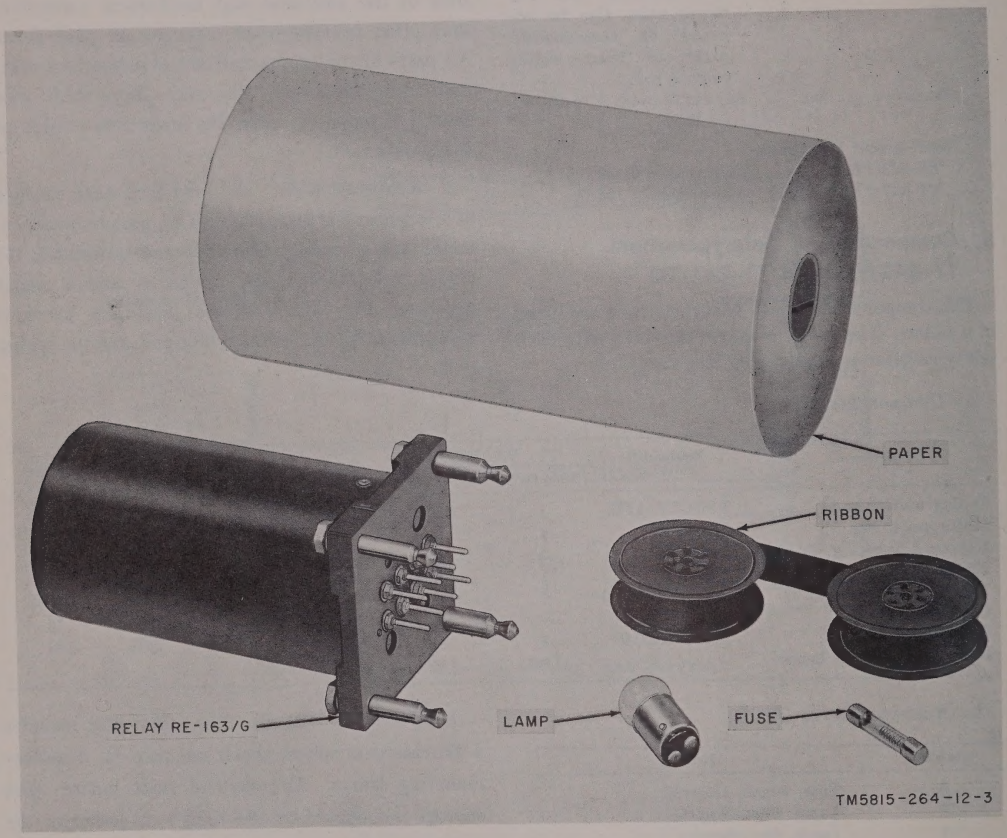


Figure 3. Running spares.

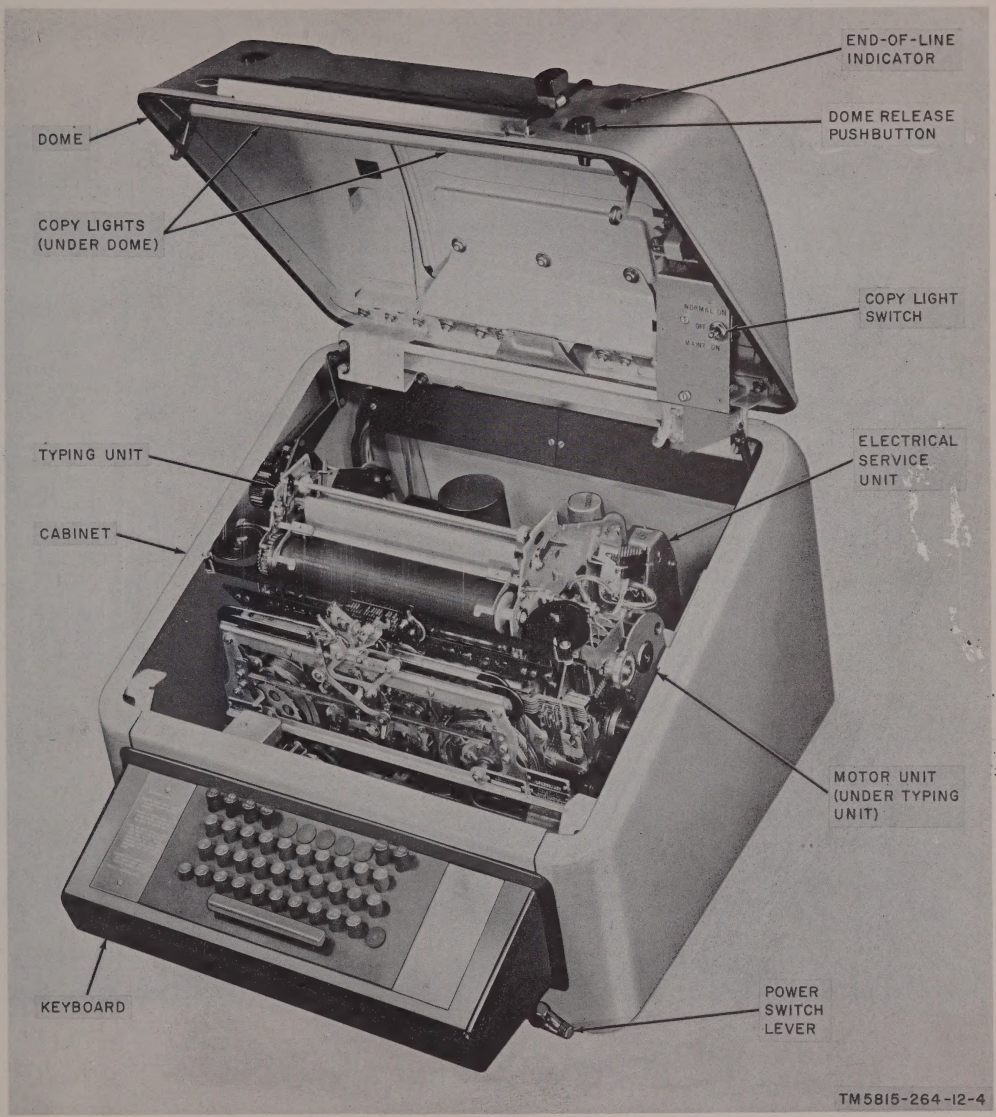
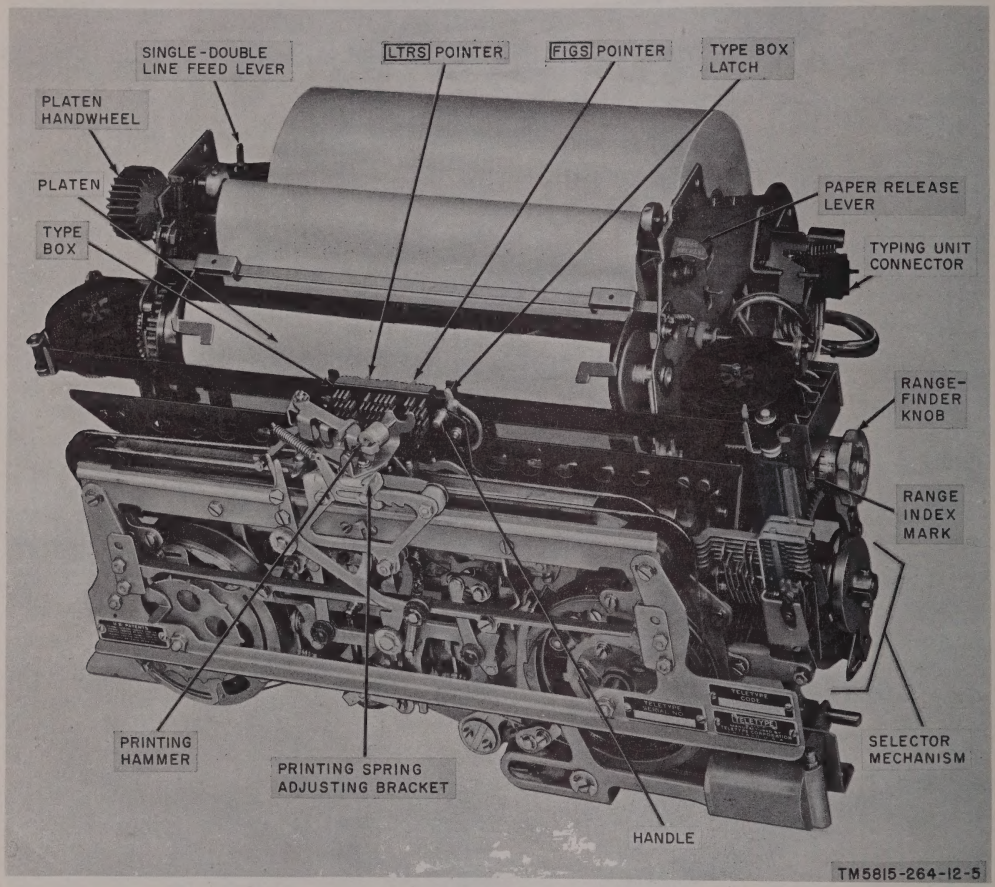


Figure 4. Teletypewriter TT-247/FG, showing all components.


SINGLE-DOUBLE LINE FEED LEVER
LTRS POINTER
FIGS POINTER
TYPE BOX LATCH
PLATEN HANDWHEEL
PLATEN
TYPE BOX
PAPER RELEASE LEVER
TYPING UNIT CONNECTOR
RANGE-FINDER KNOB
RANGE INDEX MARK
PRINTING HAMMER
PRINTING SPRING ADJUSTING BRACKET
HANDLE
SELECTOR MECHANISM
TM5815-264-12-5

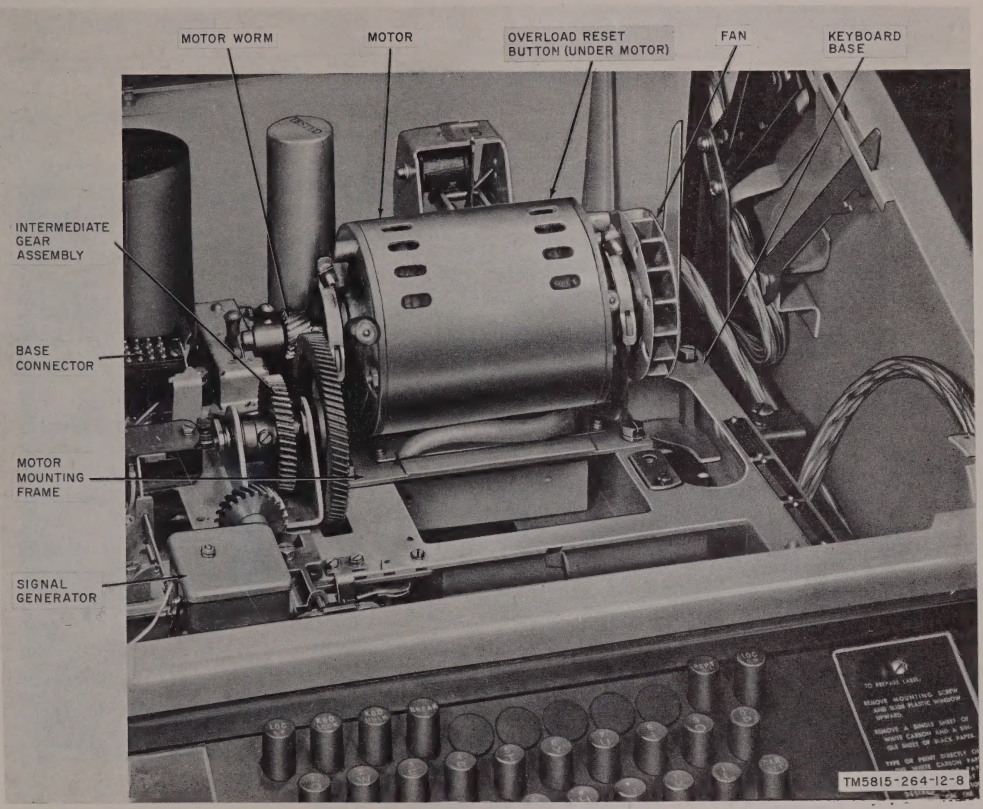


Figure 6. Interior view of cabinet, typing unit removed.

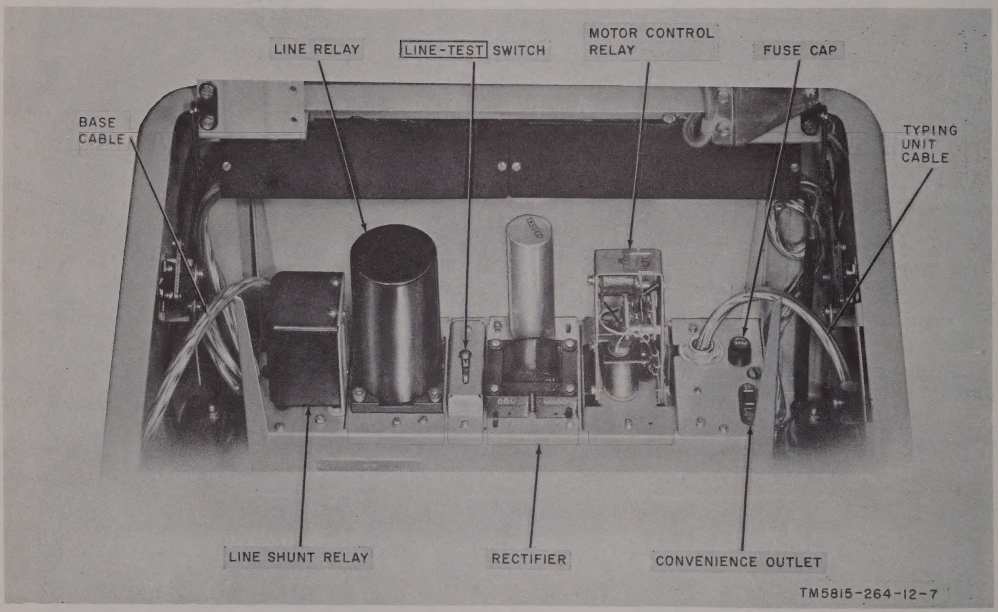


Figure 7. Electrical service unit installed in cabinet.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. OPERATOR'S CONTROLS AND INDICATORS

7. Controls

a. Cabinet (fig. 4).

Control	Control position	Function
Power switch lever	Up	Turns power on.
	Down	Turns power off.
Copy light switch	OFF	Prevents copy lights from being turned on.
	MAINT ON	Turns copy lights on when power switch lever in down.
	NORMAL ON	Permits control of copy lights by power switch lever.

b. Typing Unit (fig. 5).

Control	Control position	Function
Platen handwheel	Downward	Permits manual rotation of platen.
Single-double line feed lever	Forward	Single line feed position.
	Rearward	Double line feed position.
Paper release lever	Forward	Presses paper tightly against platen.
	Rearward	Releases paper.
Printing spring adjusting bracket.	Notch 1	Adjusts printing hammer impact for clear printing of from one to three copies.
	Notch 2	Adjusts printing hammer impact for clear printing of four or five copies.
	Notch 3	Adjusts printing hammer impact for clear printing of six or more copies.
Rangefinder knob		Adjusts selector portion of local typing unit for best performance.

c. Keyboard (fig. 8).

Control	Function
LOC LF key	When depressed, feeds paper or *local* typing unit continuously until released.
REC key	Locks keyboard, placing *local* teletypewriter in *"receive-only"* condition.
SEND key	Unlocks keyboard to permit transmission from *local* teletypewriter.
BREAK key	When depressed, opens signal circuit. Used to start motors of teletypewriters from *"standby condition"* (par. 13*b*).
REPT key	When depressed simultaneously with a character key, repeats transmission of that character until REPT key is released.
LOC CR key	Returns type box carriage of *local* teletypewriter to left margin.
CAR RET key	Returns type box carriage to *all* interconnected teletypewriters to left margin.
LINE FEED key	Feeds paper of all interconnected teletypewriters either one or two line spaces, as determined by position of single-double line feed lever of *each* teletypewriter (*b* above).
FIGS key	Moves type box carriage to letters shift position. Also used in conjunction with LTRS key to activate selective calling mechanism (par. 14 *a*(1).
LTRS key	Moves type box carriage to letters shift position. Also used in conjunction with FIGS key to activate selective calling mechanism.
BELL key	When pressed (while type box is in figure shift position) rings signal bell to signal operators at other stations.
Blank key	When pressed causes transmission of special-purpose blank code group.
STOP key	When pressed (while type box is in figures shift position stops motor of local teletypewriter and all other interconnected teletypewriters that are equipped with motor stop feature.

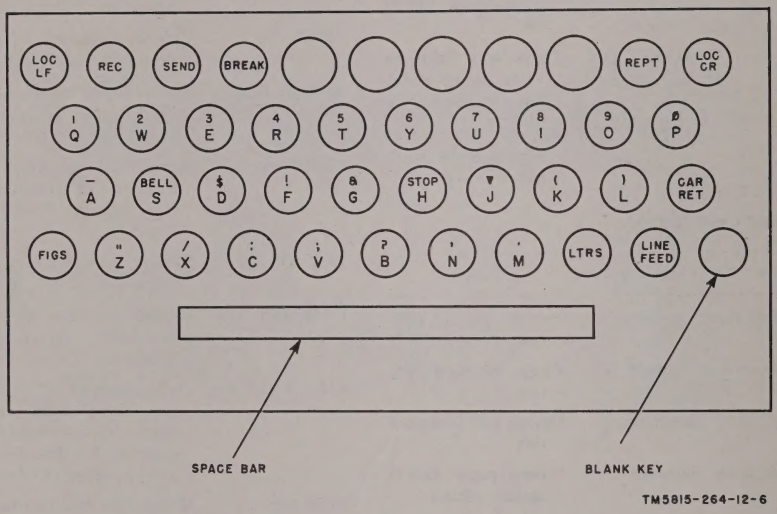


Figure 8. Keyboard controls.

d. Electrical Service Unit (fig. 7). The electrical service unit contains a two-position LINE-TEST switch. In the LINE position, it connects the teletypewriter to the external signal circuit; in the TEST position, it switches the teletypewriter to a local test condition.

e. Motor Unit (fig. 6). The motor unit contains an overload reset button which, when pressed, starts the motor after it has been stopped because of overheating.

8. Indicators

a. Typing Unit (fig. 5).

Indicator	Function
LTRS pointer	Indicates that type box carriage is in letters shift position when pointer is alined with printing hammer.
FIGS pointer	Indicates that type box carriage is in figures shift position when pointer is alined with printing hammer.

b. Cabinet.

Indicator	Function
Signal bell	Signals operator.
End-of-line indicator (fig. 4)	Lights to warn operator that only six more characters may be printed before CAR Ret key must be depressed.

Section II. OPERATION UNDER USUAL CONDITIONS

9. Type of Operation

Teletypewriters TT–243/FG and TT–247/FG are designed for half-duplex operation. This type of operation permits the transmission and reception (but not simultaneously) of teletypewriter messages. The teletypewriters also print a home copy of transmitted messages.

10. Preliminary Starting Procedure

a. See that the power connector is inserted fully into the power outlet.

b. Check the paper supply. If low, install a new roll (par. 11).

c. Check the condition of the ribbon in the typing unit. If the ribbon is frayed or badly worn, replace it (par. 12).

d. Press the door release pushbutton (fig. 1) and tilt the copy door upward. Push the single-double line feed lever (fig. 5) to the left and pull it forward for single line feed; push it backward for double line feed.

e. Press dome release pushbutton (fig. 1) and tilt the dome upward. Position printing spring adjusting bracket (fig. 5) to the appropriate notch (par. 7*b*).

11. Installing Paper

a. Press dome release pushbutton (fig. 1) and tilt dome upward.

b. Push paper release lever (fig. 9) rearward, lift paper fingers, and pull paper from beneath platen.

c. Lift the old roll of paper from teletypewriter and remove spindle from core of roll.

d. Insert spindle into core of the new roll of paper. Place spindle in position to have the paper feeding from underneath the roll toward the front of the teletypewriter.

e. Feed the paper over the paper straightener rod, downward around the platen, and upward between the platen and the paper fingers.

Caution: **Do not disturb the ribbon or type box latch while inserting paper.**

f. Bring the paper upward a few inches beyond the top of the platen and straighten the paper; then lower the paper fingers against the paper and pull the paper release lever forward.

g. Close the dome, press the door release pushbutton (fig. 1), and tilt copy door upward. Hold the end of the paper toward the front, and close the copy door.

12. Installing or Changing Ribbon

a. Press the dome release pushbutton (fig. 1) and tilt the dome upward.

b. Lift the ribbon spool locks (fig. 10 and 11) to the unlocked (vertical) position and remove both ribbon spools from their shafts.

c. Remove the ribbon from the ribbon rollers, ribbon reverse levers, and ribbon guides.

d. Unwind and remove the old ribbon from one of the ribbon spools. Remove both ribbon spools from the typing unit.

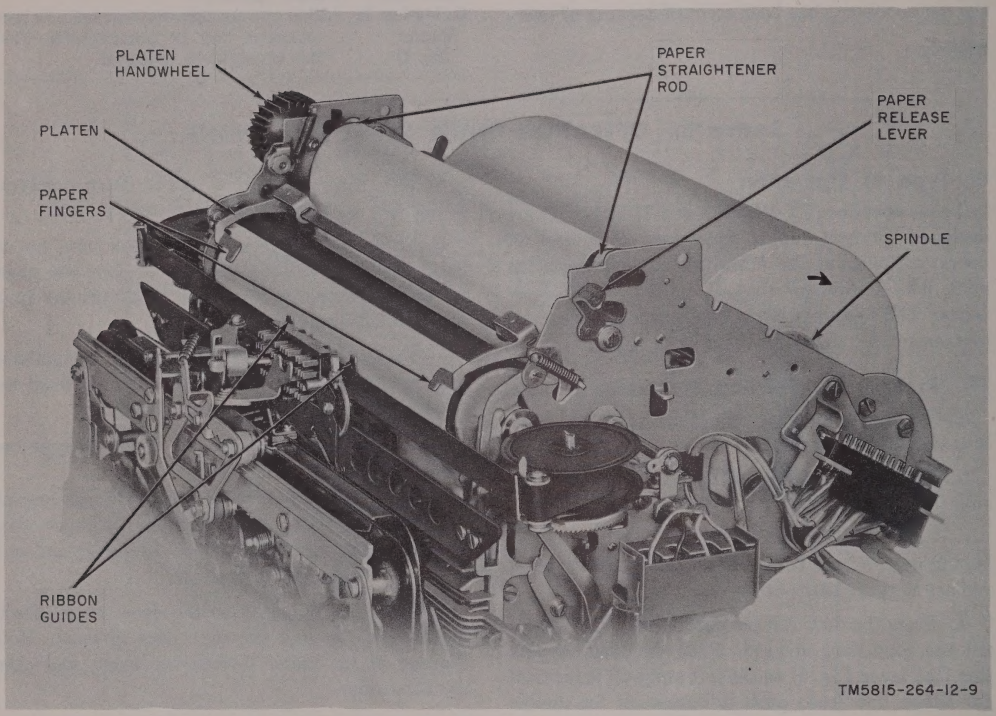


Figure 9. Paper installed in typing unit.

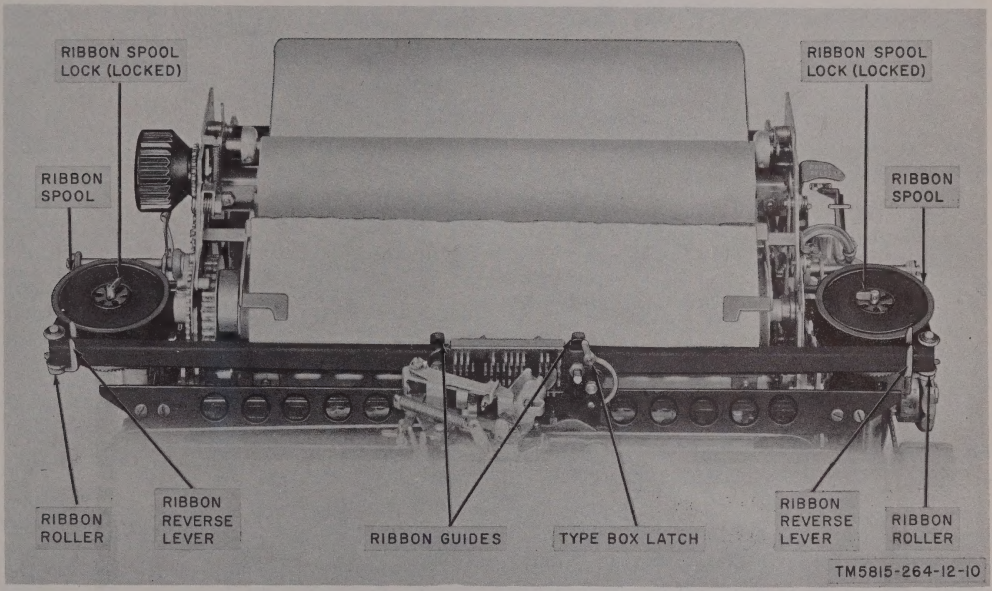


Figure 10. Ribbon installed in typing unit.

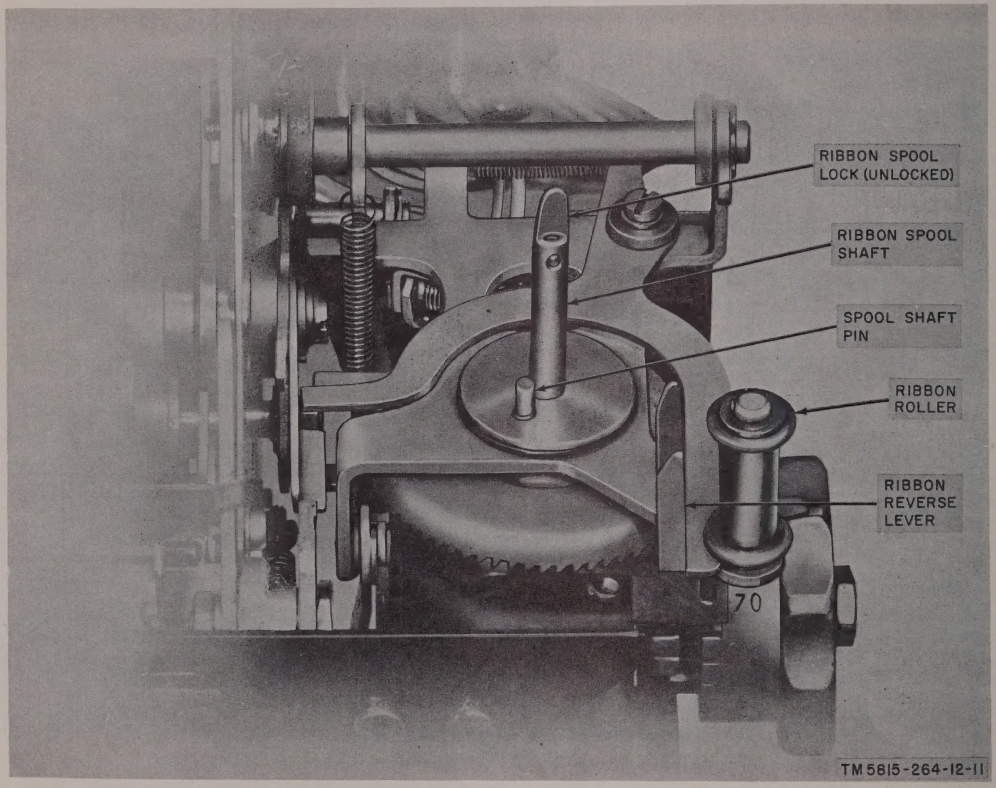


Figure 11. Typing unit ribbon spool assembly.

e. Hook the end of the new ribbon to the hub of the empty spool and wind the ribbon until the reversing eyelet is on the spool.

f. Replace the spools on the ribbon shafts; be sure that the spools engage the spool shaft pins (fig. 11) and that the ribbon feeds forward from the outside of the spool (fig. 10). Set the ribbon spool locks to the locked (horizontal) position to lock the spools in place.

g. Thread ribbon around both ribbon rollers and through slots in ribbon reverse levers and ribbon guides. Turn the free spool to take up slack and check to be sure ribbon is threaded properly through ribbon guides and that reversing eyelet is between spool and reverse lever. Also see that the type box latch (fig. 10) has not been moved from the left (engaged) position.

h. Turn the paper upward a few inches by pressing downward and turning the platen handwheel. Close the dome, press the copy access door pushbutton (fig. 1), and tilt the door upward. Hold the end of the paper toward the front and close the copy access door.

13. Starting Procedure

Start the teletypewriter as described in *a* or *b* below.

a. Starting From Shutdown Condition. Set the power switch lever (fig. 1) to the upper position to start the motor. If it does not start, press and release the SEND key and then the BREAK key.

b. Starting From Standby Condition. Press and release the BREAK key.

14. Operating Procedures

Operate the teletypewriter to transmit and receive messages (not simultaneously) as described below. During operation, be alert for any improper reaction to the operation of any of the controls, and for unusual sounds from within the cabinet. If the teletypewriter fails to operate properly, refer to paragraph 21.

a. Transmitting Messages. Press the BREAK key and then the SEND key. If the message is to be transmitted to all teletypewriters in the circuit, transmit as described in (2) below. If the teletypewriters in the circuit are equipped with the selective calling feature, perform the procedure described in (1) below.

(1) *Selective calling.* Press the FIGS key twice, then the LTRS key twice, and then send your local call-directing characters. Then press the FIGS key twice; the LTRS key twice; and send the call-directing characters of the station that is to receive the message. If more than one station is to receive the message, repeat the FIGS, LTRS, and call-directing character sequence for *each* of the stations. Upon completion of station selection, transmit the message as described in (2) below. After completion of all transmission to the selected station(s) press the blank key three times to restore all teletypewriters in the circuit to the original condition.

(2) *Keyboard operation.* Operate the keys of the keyboard (fig. 8) in a manner similar to that used when typing with an ordinary typewriter except as follows:

(a) Always press the SEND key before starting transmission.

(b) Always press the REC key after completion of transmission to place the local teletypewriter in a receive-only condition.

(c) Press the FIGS key to move the type box carriage to the figures shift position for the printing of uppercase symbols.

(d) Press the LTRS key to return the type box carriage to the letters shift position for the printing of letters.

(e) Press the CAR RET key to cause the type box carriage of *all* teletypewriters in the circuit to return to the left margin.

(f) Press the LOC CR key to cause the type box carriage of only the *local* teletypewriter to return to the left margin.

(g) Press the REPT key and any character key simultaneously to send the character continuously until the REPT key is released.

(h) Press the LINE FEED key to feed the paper of *all* teletypewriters in the circuit.

(i) Press the LOC LF key to feed the paper of the *local* teletypewriter only. Release the key to stop local line feed.

(j) Press the FIGS key and then the BELL-S key to signal operators of the distant teletypewriters.

(k) Press and immediately release the space bar to cause the type box carriage to move one space without printing. Hold the space bar down to cause it to continue to move to the right without printing. Release the space bar when the carriage has reached the point where printing is to begin.

Note. The TT-243/FG and TT-247/FG are equipped with an automatic carriage return and line feed feature which operates *automatically* when the type box carriage reaches the right margin. When sending messages, *be sure to press the CAR RET and LINE FEED keys at the end of each line* to insure that the carriage return and line feed operations occur at other teletypewriters that may not be equipped with the automatic feature.

b. Interrupting Incoming Message. If it is necessary to interrupt an incoming message, press the BREAK key for several seconds and then release it. This action places *all* teletypewriters into a receive-only condition. Press the SEND key to permit transmission from the local teletypewriter.

c. Receiving Messages. After the teletypewriter is started (par. 13), incoming messages are received and printed automatically by the typing unit portion of the teletypewriter. During reception, check the paper supply occasionally.

Note. As the end of a roll of paper nears, a red stripe appears down the center of the paper to warn the operator that a new roll must be installed.

d. Producing Local Page Copy. When it is necessary either to produce copy on the local teletypewriter without transmitting the information to the other stations, or to make a local test of the teletypewriter, perform the following:

(1) Press the door release pushbutton (fig. 1) and tilt the copy door upward.

(2) Set the LINE-TEST switch to the TEST position.

(3) Hold the end of the paper forward and close the copy door.

(4) Set the power switch lever to the upward position.

(5) Press the SEND key and operate the keyboard (*a*(2) above).

(6) When completed, restore the LINE-TEST switch to the LINE position.

15. Stopping Procedure

Use the applicable procedure described below to stop the teletypewriter.

a. Standby Condition. To place all interconnected teletypewriters equipped with the motor stop feature into a standby condition, press the FIGS key and then the STOP-H key. When in this condition, the motors of all teletypewriters are stopped by operation of the motor stop mechanism, and the operator at any of the stations can start all teletypewriters by pressing and releasing the BREAK key.

b. Complete Shutdown. To close the teletypewriter to traffic, set the power switch lever (fig. 1) to the lower position.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

16. Scope of Organizational Maintenance

a. Organizational maintenance of the TT–243/FG and TT–247/FG is limited to the maintenance duties normally performed by the operator.

b. Maintenance consists of the following:

(1) Preventive maintenance (par. 18).

(2) Visual inspection (par. 19).

(3) Replacement of paper and ribbon (pars. 11 and 12).

(4) Cleaning type box (par. 20).

(5) Operator's corrective maintenance (par. 21).

(6) Replacement of parts (par. 23).

17. Maintenance Materials Required

The maintenance materials listed below are the only items required for organizational maintenance.

a. Brush, typewriter, toothbrush style, Federal stock No. 7510–178–8320.

b. Clean, lint-free cleaning cloth.

c. Cleaning compound (Federal stock No. 7930–395–9542 is used to clean the cabinet exterior.

Warning: Prolonged breathing of cleaning compound fumes is dangerous. Be sure adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame.

18. Preventive Maintenance

a. DA Form 11–252. DA Form 11–252 (figs. 12 and 13) is a preventive maintenance checklist to be used by an operator. Items not applicable to organizational maintenance of the teletypewriter are lined out. References in the ITEM block are to paragraphs which contain additional maintenance information pertinent to the particular item. Follow the instructions on the form.

b. Items. The information below is supplementary to DA Form 11–252. The item numbers correspond to the ITEM numbers on the form.

Item	Maintenance procedure
1	Observe, in particular, the spacing between letters, printing of errors, the operation of line feeding, figures and letters shift, margin spacing, carriage return, and ribbon reversing.
2	A clean, dry cloth is normally used for cleaning the exterior of the cabinet. If this is not satisfactory, moisten a cloth with cleaning compound (par. 17*c*) and rub briskly; then wipe dry with a clean, dry cloth.

19. Visual Inspection

a. Check the condition of the ribbon. If the edges are frayed, check for proper threading in the ribbon guides.

b. Check the clearness of the typed copy. If the printing is blurred or smudged, clean the type box (par. 20).

c. Check the condition of the keys on the keyboard. If the lettering is hidden by dirt, clean the tops of the keys with a water-moistened cloth and wipe dry. If any keys are broken or missing, notify higher echelon maintenance personnel.

20. Cleaning Type Box

Remove, clean, and replace the type box as follows:

a. Removal.

(1) Set the power switch lever (fig. 1) to the lower position, press the dome release pushbutton, and tilt the dome upward.

(2) Unlock the type box latch (fig. 5) by moving it to the right.

(3) Grasp the handle on the right side of the type box; move it upward and to the left until the left side of the type box is unhooked; then lift the type box from the typing unit.

b. Cleaning. Clean the type box pallets with the toothbrush style typewriter brush.

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TELETYPEWRITER
(AR 750-625)

EQUIPMENT NOMENCLATURE

TELETYPEWRITER TT-243/FG

EQUIPMENT SERIAL NUMBER

288

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon:
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

OPER-ATOR	2/3 ECH-ELON	DATE	SIGNATURE
✓		6 FEB 1960	PFC John Smith

U. S. GOVERNMENT PRINTING OFFICE: 1957 O—427033

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DA FORM 1 MAY 57 11-252

REPLACES DA FORMS 11-252, 1 OCT 55; 11-253, 11-262, AND 11-263; WHICH ARE OBSOLETE.

Figure 12. DA Form 11-252, pages 1 and 4.

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF FEB 1960

NO.	DAILY ITEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	~~3D~~ 3D ECH-ELON
		QS	QS	QS	QS	QS	QS											
		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
1.	CHECK FOR NORMAL OPERATION OF EQUIPMENT. BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION. PAR 14, 18, 19	✓	✓	✓	✓	✓	✓											
2.	CLEAN DIRT, OIL AND MOISTURE FROM THE EXPOSED SURFACES OF THE TELETYPEWRITER AND COVER. PAR 18, 19	✓	✓	✓	✓	✓	✓											
3.	INSPECT ALL EXTERNAL SWITCHES FOR PROPER MECHANICAL ACTION, FREEDOM OF MOVEMENT AND POSITIVE ACTION.	✓	✓	✓	✓	✓	X											
4.	EMPTY CHAD BOXES ON REPERFORATORS AND CHECK BY OPERATION THAT CHAD BOXES ARE FREE OF OBSTRUCTIONS.																	

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. ~~CLEAN THE INSIDE AND OUTSIDE OF TRANSIT CASES. INSPECT FOR BROKEN OR MISSING LATCHES, HANDLES AND EQUIPMENT SUPPORTS OR BRACKETS.~~						
6. INSPECT EXTERNAL CABLES AND CORDS FOR CUTS OR GOUGED JACKETS, FRAYING, BAD BRUISES OR KINKS AND BROKEN PLUGS OR CONNECTORS.	✓					
7. INSPECT EXTERNAL BINDING POSTS AND TERMINAL BLOCKS FOR CRACKS, BREAKS, DIRT, LOOSE SCREWS, LOOSE CONNECTIONS AND MOUNTINGS.	✓					

~~ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS~~	CONDITION
8. ~~INSPECT FOR, AND TIGHTEN, ANY LOOSE SCREWS, NUTS OR BOLTS ON THE COVER OR TRANSIT CASES. CHECK FOR BROKEN CATCHES, LATCHES, HANDLES, HINGES AND MOUNTINGS.~~	
9. INSPECT COVER WINDOWS FOR CRACKS, BREAKAGE, OR OTHER DAMAGE.	✓
10. ~~INSPECT ALL ELECTRICAL PLUGS AND RECEPTACLES FOR BREAKAGE, FIRM SEATING, PROPER CONTACT, CORROSION AND GREASE OR OIL DEPOSITS. CLEAN IF REQUIRED.~~	
11. ~~INSPECT CABLES, CORDS AND WIRING FOR CUT OR GOUGED JACKETING, KINKS, BAD BRUISES OR FRAYING.~~	
12. ~~INSPECT BINDING POSTS AND TERMINAL BLOCKS FOR CRACKS, BREAKS, DIRT AND LOOSE CONNECTIONS.~~	
13. ~~INSPECT FOR LOOSE MOUNTING SCREWS AND NUTS ON PARTS OR BRACKETS.~~	
14. ~~INSPECT ALL SWITCHES FOR BINDING, FREEDOM OF MOVEMENT AND POSITIVE ACTION.~~	
15. ~~INSPECT MOTOR AND GOVERNOR FOR WORN BRUSHES AND CONTACTS. CLEAN IF REQUIRED.~~	

~~ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS~~	CONDITION
16. CLEAN THE TYPE PALLETS. PAR 20	Ø
17. ~~CLEAN THE KEYTOPS AND CHECK FOR BROKEN, MISSING, LOOSE, OR ILLEGIBLE KEYTOPS.~~	
18. ~~CLEAN INK FEED TUBES AND INK WELLS; REPLACE INKING FELT OR TYPING RIBBON IF REQUIRED.~~	
19. ~~INSPECT GENERAL CONDITION OF LUBRICATION AND LUBRICATE AS REQUIRED IN ACCORDANCE WITH APPLICABLE LUBRICATION INSTRUCTIONS.~~	
20. ~~CLEAN EXCESS OIL, GREASE AND DIRT FROM MECHANICAL ASSEMBLAGES, GEARS, SHAFTS, FRAMES, ETC.~~	
21. ~~PERFORM ANY ADJUSTMENT REQUIRED AS A RESULT OF CLEANING, LUBRICATION OR NORMAL WEAR.~~	
22. ~~INSPECT FOR FREE MOVEMENT OF ALL MOVING PARTS: BENT, BROKEN, DISTORTED OR WORN SHAFTS, GEARS, CAMS, SPRINGS, CLUTCHES, BUSHINGS AND BEARINGS.~~	
23. ~~OPERATE EACH KEY AND CHECK THE FUNCTIONAL RESPONSE.~~	
24. ~~CHECK THAT THE PRINTING ON PAGE PRINTERS IS IN ALIGNMENT HORIZONTALLY AND THAT THE CHARACTERS ARE EVENLY SPACED AND FULLY PRINTED. CHECK THAT THE CHARACTERS ARE FULLY PRINTED ON TYPING REPERFORATORS.~~	
25. ~~CHECK THE TAPE OF TYPING AND NON-TYPING REPERFORATORS AND PERFORATORS FOR CLEAN PUNCHING OF CODE AND FEED HOLES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

ITEM 3. COPYLIGHT SWITCH INOPERATIVE. REPORTED FOR HIGHER ECHELON REPAIR.

2 3

Figure 13. DA Form 11-238, pages 2 and 3.

Caution: Do not use any cleaning solution or cleaning compound on the type box. Never clean the type box while the box is mounted in the typing unit.

c. Replacement

(1) Hold the type box so that the larger hook is on the left and the type is facing toward the platen. Place the larger hook under the stud in front of the left type box roller and push the smaller hook on the right side downward into place on the stud of the right type box roller.

(2) Hold the type box latch in the horizontal position and move it to the left over the latching notch as far as it will go. Raise the latch to a vertical position and press it to the left until it locks into position.

(3) Check to make certain that the ribbon has not been disturbed and is threaded properly in its guides.

(4) Close the dome, press the door release pushbutton (fig. 1) and tilt the copy door upward. Feed the paper upward in the typing unit, hold the end of the paper forward, and close the copy door. Set the power switch lever to the upper position.

21. Operator's Checklist

Listed below are a few common faults which may be encountered by the operator and actions which may be performed by him to correct each fault. If the corrective actions listed do not correct the fault, higher level maintenance is required.

Symptom	Probable trouble	Correction
Motor does not start when power switch lever is in upper position.	Teletypewriter in standby condition. No power input.	Press and release BREAK key (fig. 8). Check for power at receptacle and see that power input plug is inserted fully into receptacle.
	Teletypewriter fuse blown.	Replace with new fuse (par. 23*a*).
	Motor overheated.	Move power switch leved downward, open dome, and allow motor to cool. Press overload reset button (fig. 6) and move power switch lever upward. If motor starts, and then stops again, higher-level maintenance is required.
Motor runs but teletypewriter cannot send.	Teletypewriter in "receive-1 only condition.	Press SEND key.
Teletypewriter "runs open" or prints garble.	Defective external signal lines or faulty incoming signals.	Make local test (par. 14*d*). If teletypewriter operates properly, notify supervisory personnel.
	Local teletypewriter defective.	Make local test (par. 14*d*). If teletypewriter does not operate properly: Check rangefinder adjustment (par. 22). Replace relay (par. 23*c*).
Paper does not feed properly.	Paper improperly installed.	Reinstall paper (par. 11).
	Paper release lever in pressure released position.	Move paper release lever (fig. 5) to pressure (rear) position.
Copy lamp or end-of-line indicator does not light.	Copy lamp defective.	Replace lamp (par. 23*b*).
	End-of-line indicator lamp defective.	Replace lamp (par. 23*b*).

22. Adjusting Rangefinder

a. Press the dome release pushbutton (fig. 1) and tilt the dome upward.

b. Arrange to have one of the other stations in the circuit send alternate R and Y test signals continuously.

c. Push the rangefinder knob (fig. 5) inward to engage the teeth on the rear of the knob with the adjacent teeth of the rangefinder sector and perform the following:

(1) Turn the knob *clockwise slowly* until errors appear in the typed copy. Turn the knob in the opposite direction slowly until

the typing unit no longer prints errors. Note the number in line with the range index mark.

(2) Turn the rangefinder knob *counterclockwise slowly* until errors appear. Turn the knob in the opposite direction until the typing unit no longer prints errors, and note the number in line with the range index mark.

(3) Set the rangefinder knob midway between the readings obtained in (1) and (2) above.

d. Close the dome, press the door release pushbutton (fig. 1), and tilt the copy door upward. Hold the end of the paper forward and close the copy door.

23. Replacement of Parts

Part replacement at organizational level is limited to the replacement of the running spare parts furnished with the teletypewriters. Replace the running spares as described below:

a. Fuse Replacement.

(1) Set the power switch lever (fig. 1) to the lower position. Press the dome release pushbutton and tilt the dome upward.

(2) Grasp the fuse cap (fig. 7) and twist it to the left while applying a slight downward pressure.

(3) Lift the fuse cap out and remove the old fuse.

(4) Check the new 4-ampere fuse to determine that it is not defective and is of the proper value.

Caution: Never replace a fuse with one of a higher rating. If a fuse burns out immediately after replacement, notify higher echelon maintenance personnel; do not replace it a second time.

(5) Insert the new fuse in the fuse cap and replace the cap in the fuseholder. Press the fuse cap and twist it to the right to secure it in the fuseholder.

(6) Close the dome, press the door release pushbutton (fig. 1), and tilt the copy door upward. Hold one end of the paper forward and close the copy door. Set the power switch lever to the upper position.

b. Lamp Replacement.

(1) If the teletypewriter motor is on, set the power switch lever (fig. 1) to the lower position.

(2) Press the dome release pushbutton and tilt the dome upward to expose the copy light lamps and end-of-line indicator lamp (fig. 4).

(3) Remove the defective lamp by turning it to the left while applying a slight pressure toward the socket.

(4) Install a new lamp (fig. 3) in the empty socket.

(5) Perform the step described in *a*(6) above.

c. Line Relay Replacement.

(1) Set the power switch lever (fig. 4) to the lower position.

(2) Press the dome release pushbutton and tilt the dome upward.

(3) Pull the line relay (fig. 7) from its socket.

(4) Install new line relay in the electrical service unit. When installing the new relay, position the four guideposts to have the two larger posts toward the rear of the electrical service unit.

(5) Perform the step described in *a* (6) above.

d. Installing Paper and Ribbon. Refer to paragraphs 11 and 12 for installation procedures.

CHAPTER 4

DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

24. Authority for Demolition

Demolish the teletypewriter only upon order of the commander. Use the destruction procedures outlined in paragraph 25 to prevent further use of the equipment.

25. Methods of Destruction

a. Smash. Smash the controls, magnets, switches, castings, capacitors, clutches, shafts, gears, and bearings; use a sledge, axe, handaxe, pickaxe, hammer, or crowbar.

b. Cut. Cut the input power cord, the output cords, internal wiring, and external cabling; use an axe, cutting pliers, bayonet, or machete.

c. Burn. Burn all cords, wiring diagrams, technical manuals, coils, and relays; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

d. Bend. Bend covers, frames, cabinets, and bases.

e. Explode. If explosives are necessary, use firearms, grenades, or TNT.

f. Dispose. Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

APPENDIX

MAINTENANCE ALLOCATION

1. General

a. Scope. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate echelon. It also specifies the tool and test equipments authorized at each echelon to perform the assigned maintenance functions.

b. Maintenance Allocation Chart Columns.

(1) *Part or component.* Only the nomenclature or standard item name is shown in this column. Components and parts comprising the major end item are listed alphabetically. Assemblies, subassemblies, and related parts are arranged as groups. The component parts of each group are listed alphabetically immediately below the group listing. Mounting hardware, such as screws, bolts, nuts, washers, brackets, and clamps, is not included in the list.

(2) *Maintenance function.* This column indicates the various maintenance functions that will be performed for each part or assembly listed. These are defined as follows:

(a) Service. To clean; to preserve; and to replenish lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment, such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(f) Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required, utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(g) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of each of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol "X" indicates the echelon *and* higher echelons are responsible for the maintenance function indicated. Repair parts may not, necessarily, be stocked at the echelon indicated; refer to the applicable repair parts and special tools list.

(4) *Tools required.* The numbers in this column indicate tool and test equipments required to perform the related maintenance function. These numbers are identified in allocation of tools for maintenance functions.

(5) *Remarks.* This column contains any notations necessary to clarify the data cited in the preceding columns.

c. Columns in the allocation of Tools for Maintenance Functions.

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, and 5th, echelon.* A dagger (†) symbol indicates the echelon allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to the theatre headquarters or communication zone to provide theatre communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TELETYPEWRITER SETS TT-243/FG AND TT-247/FG	service	X						Except lubrication
				X			6	Including lubrication
	adjust	X						Performs rangefinder adjustment
				X			6,7	All adjustments
	inspect	X						External parts
				X				Interior parts
	test	X						Operational tests
				X			1,2,3,4	Performs resistance, voltage and current measurements to determine conditioner circuits; Conducts distortion test
					X		1,2,4,5	Conducts all tests to insure equipment returned to user meets minimum mechanical visual, electrical and operational requirements
	rebuild					X	6,7	
AUTOMATIC TYPING UNIT GROUP (LP59WY/AEK)								
ARMATURE, ELECTROMAGNETIC ACUTATOR	replace			X			6	
ARMS	replace			X			6	
BAILS	replace			X			6	
BALL BEARING	replace			X			6,7	
BARS	replace			X			6	
BEARINGS, BALL, ANNULAR	replace			X			6,7	
BEARINGS, CONE	replace			X			6,7	
BEARINGS, ROLLER	replace			X			6	
BEARING, SLEEVE	replace			X			6,7	
BELL CRANKS	replace			X			6	
BLOCK, BEARING	replace			X			6	
BLOCK, CONTACT	replace			X			6	
BLOCK, GUIDE	replace			X			6	
BRACKETS	replace			X			6	
BUSHINGS	replace			X			6	
CAMS	replace			X			6	
CODE BARS	replace			X			6	
COLLARS	replace			X			6	
CONNECTORS	replace			X			6	
CONTACTS	replace			X			6	
CUP, DASHPOT VALVE	replace			X			6	

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PART OR COMPONENT	MAINTENANCE FUNCTION	1ST ECH.	2ND ECH.	3RD ECH.	4TH ECH.	5TH ECH.	TOOLS REQUIRED	REMARKS
TT-243/FG AND TT-247 (continued)								
DETENT	replace			X			6	
DIAL, CONTROL	replace			X			6	
DISKS	replace			X			6	
DRUMS	replace			X			6	
ECCENTRICS	replace			X			6	
ELECTROMAGNET	replace			X			6	
FELTS	replace			X			6	
FORKS	replace			X			6	
GEARS	replace			X			6,7	
GUIDES	replace			X			6	
HAMMER	replace			X			6	
HUBS	replace			X			6	
KEYS, CAMDISK	replace			X			6	
KNOBS	replace			X			6	
LATCHES	replace			X			6	
LEVERS	replace			X			6	
LINKS	replace			X			6	
PAPER, TELETYPEWRITER ROLL	replace	X						
PAWLS	replace			X			6	
PLATEN	replace			X			6	
PLATES	replace			X			6	
POST	replace			X			6,7	
PULLEYS, GROOVED	replace			X			6	
RAIL	replace			X			6	
RATCHETS	replace			X			6	
RETAINERS	replace			X			6	
RIBBON, TELETYPEWRITER	replace	X						
RINGS	replace			X			6	
ROLLERS	replace			X			6	
ROLLERS, PRESSURE	replace			X			6	
SHAFTS	replace			X			6,7	
SHIMS	replace			X			6	
SLIDES	replace			X			6	
SOLENOID	replace			X			6	
SPACERS	replace			X			6	
SPRINGS	replace			X			6	
SPRINGS, CONTACT	replace			X			6	

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TT-243/FG AND TT-247 (continued)								
SPRINGS, FLAT	replace			X			6	
STRIPPER	replace			X			6	
STUDS	replace			X			6,7	
TYPE BOX	rebuild			X			6	
DUMMY PALLETS	replace			X			6	
NUTS	replace			X			6	
PALLETS	replace			X			6	
SCREW	replace			X			6	
SPRING (157238)	replace			X			6	
WIRE ROPE ASSEMBLIES	replace			X			6	
CABINET GROUP (LAC-203; LAC-204)								
ARMS	replace			X			6	
ARMATURE	replace			X			6	
BUMPERS	replace			X			6	
BUSHINGS	replace			X			6,7	
CONNECTORS	replace			X			6	
ELECTROMAGNET	replace			X			6	
FOOT	replace			X			6	
GASKET	replace			X			6	
GROMMETS	replace			X			6	
KNOB	replace			X			6	
LAMP	replace	X						
LAMPHOLDER	replace			X			6	
LENS, INDICATOR LIGHT	replace			X			6	
LEVER	replace			X			6	
MOUNT	replace			X			6	
PAD	replace					X	6	
POST	replace			X			6,7	
SHAFT	replace			X			6,7	
SPRINGS	replace			X			6	
STUDS	replace			X			6,7	
SUPPRESSORS	replace			X			6	
SWITCH TOGGLE	replace			X			6	
TERMINAL BLOCKS	replace			X			6	
TRANSFORMERS	replace			X			6	
WINDOW OBSERVATION	replace			X			6	
ELECTRICAL SERVICE UNIT GROUP (LESU-42)								

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TT-243/FG AND TT-247 (continued)								
ARMATURE, ELECTROMAGNETIC ACTUATOR	replace			X			6	
CONNECTORS	replace			X			6	
ELECTROMAGNET	replace			X			6	
FUSES	replace	X						
FUSEHOLDERS	replace			X			6	
LEVERS	replace			X			6	
POSTS	replace			X			6,7	
RECTIFIERS	replace			X			6	
RELAY ARMATURE	replace			X			6	
SPRINGS	replace			X			6	
STRAPS	replace			X			6	
SUPPRESSOR	replace			X			6	
SWITCH, LEVER	replace			X			6	
SWITCH, SENSITIVE	replace			X			6	
SWITCH, TOGGLE	replace			X			6	
TERMINAL BOARDS	replace			X			6	
KEYBOARD GROUP (LK-18)								
ARMS	replace			X			6	
BAILS	replace			X			6	
BALL, BEARINGS	replace			X			6	
BARS	replace			X			6	
BEARINGS, BALL, ANNULAR	replace			X			6,7	
BEARINGS, ROLLER	replace			X			6,7	
BELL CRANKS	replace			X			6	
BRACKETS	replace			X			6	
BUMPERS, RUBBER	replace			X			6	
BUSHING, ECCENTRIC	replace			X			6	
BUTTONS, PIVOT	replace			X			6	
CAMS	replace			X			6,7	
CLIPS	replace			X			6	
CODE BARS	replace			X			6	
CONNECTORS	replace			X			6	
CONTACTS, ELECTRICAL	replace			X			6	
DISK	replace			X			6	
ECCENTRICS	replace			X			6	
EXTENSION, TOGGLE	replace			X			6	
FELTS	replace			X			6	

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TT-243/FG AND TT-247 (continued)								
FILTER	replace			X			6	
GEARS	replace			X			6,7	
GROMMET	replace			X			6	
GUIDES	replace			X			6	
HUBS	replace			X			6	
KEYLEVER, ASSEMBLIES	replace			X			6	
LATCHES	replace			X			6,7	
LEVERS	replace			X			6	
LINKS	replace			X			6	
PAWLS	replace			X			6	
PLATE, GUIDE	replace			X			6	
POSTS	replace			X			6,7	
RATCHETS	replace			X			6	
RETAINER (159287)	replace			X			6	
ROD	replace			X			6	
ROLLER, BAIL	replace			X			6	
SEAL	replace			X			6	
SHAFTS	replace			X			6,7	
SHIMS	replace			X			6	
SLEEVE GEAR	replace			X			6,7	
SPACERS	replace			X			6	
SPRINGS	replace			X			6	
STUDS	replace			X			6	
SWITCHES	replace			X			6	
TERMINAL BOARDS	replace			X			6	
TOGGLE	replace			X			6	
TOGGLE, DETENT	replace			X			6	
WEDGES, LOCKING	replace			X			6	
MOTOR UNIT GROUP (LMU-3)								
CAPACITOR, FIXED, ELECTROLYTIC	replace			X			6	

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
TT-243/FG AND TT-247 (continued)								
FAN	replace			X			6	
MOTOR, AC	replace			X			6	
	rebuild					X	6,7	
BEARINGS	replace				X		6,7	
END SHIELDS	replace				X		6	
MOUNTS VIBRATION	replace				X		6,7	
ROTOR, MOTOR	replace				X		6,7	
SPRINGS	replace				X		6	
STATOR, MOTOR	replace				X		6	
RELAY	replace			X			6	
STRAPS	replace			X			6	
SWITCH, THERMOSTATIC	replace			X			6	
RELAY, ARMATURE GROUP RE-163/G (RY-30)	replace			X				
	repair			X			4,6	
	rebuild					X	4,6	
ARMATURE, RELAY	replace			X			6	
BASE, RELAY	replace			X			6	
CONTACT, ELECTRICAL	replace			X			6	
COVER, RELAY	replace			X				
INSULATORS, BUSHING	replace			X			6	
INSULATORS, PLATE	replace			X			6	
MAGNET, PERMANENT	replace			X			6	
NUT, KNURLED	replace			X			6	
PLATE, RETAINER	replace			X			6	
TERMINAL STUD	replace			X			6,7	

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH.	(3) 2ND ECH.	(4) 3RD ECH.	(5) 4TH ECH.	(6) 5TH ECH.	(7) TOOL CODE	(8) REMARKS
TT-243/FG AND TT-247 (continued)							
MULTIMETER AN/URM-105 (TELETYPEWRITER SETS TT-243/FG AND TT-247/FG)			†	†	†	1	
SHUNT, INSTRUMENT, MULTIRANGE MX-1471/U (TELETYPEWRITER SETS TT-243/FG AND TT-247/FG)			†	†	†	2	
TEST SET TS-2/TG (TELETYPEWRITER SETS TT-243/FG AND TT-247/FG			†			3	
TEST SET 1-193 (*) (TELETYPEWRITER SETS TT-243/FG AND TT-247/FG)			†	†	†	4	
DISTORTION TEST SET TS-383/GG (TELETYPEWRITER SETS TT-243/FG AND TT-247/FG)				†	†	5	
TOOL EQUIPMENT TE-50B (TELETYPEWRITER SETS TT-243/FG AND TT-247/FG			†	†	†	6	
TOOL EQUIPMENT TE-111 (TELETYPEWRITER SETS TT-243/FG AND TT-247/FG			†	†	†	7	

By Order of *Wilber M. Brucker*, Secretary of the Army:

L. L. LEMNITZER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

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11-16 (2)
11-57 (2)
11-97 (2)
11-117 (2)
11-155 (2)
11-500 AA-AE (2)
11-557 (2)
11-587 (2)
11-592 (2)
11-597 (2)

NG: State AG (3).

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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